

Fine Arts Monitoring

Wedge shootout at the Chan Centre. *by Live Sound staff*

SINCE OPENING IN 1997, the Chan Centre for the Performing Arts in Vancouver, B.C., Canada, has earned an international reputation for its striking design and stellar acoustics. It offers three performance spaces, led by the 1,200-seat Shun Concert Hall, which presents a diverse offering of performances, including classical recitals and jazz concerts, avant-garde theatre and opera productions, and folk and world music.

Recently, approval was granted to upgrade the facility's stage monitoring capabilities, with the existing wedges deemed too cumbersome for most of the venue's applications, in addition to drawing fire for lack of sonic quality and rider incompatibility. Jay O'Keeffe, head sound technician for the centre, took the process to the limit, organizing a "shootout" of leading stage wedges, with eight manufacturers bringing 17 different models for evaluation on the Shun stage.

All participants were provided with specific testing protocols and performance expectations well in advance so there would be no surprises or complaints of unfairness. Both active and passive monitors were included, as were models with a variety of driver and horn sizes.

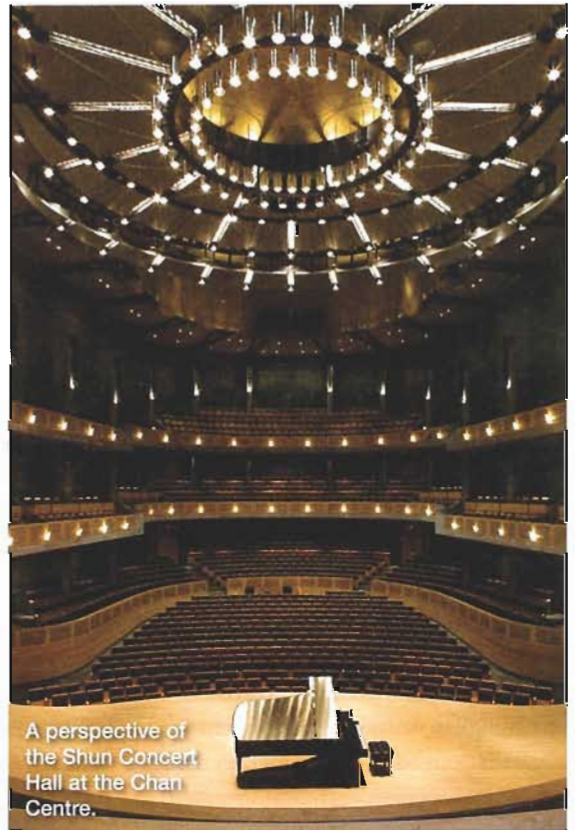
Every non-powered wedge was driven with Lab.gruppen PLM 10000Q amplifiers. Each unit was heard both un-processed, as well as with recommended factory presets, and level balancing of all monitors helped insure that the listening tests could be focused on frequency and depth of field rather than audible perception of power differentials.

There is no proscenium on the Shun Concert Hall stage, and the surfaces behind the performance area are designed to acoustically amplify and disperse sound into the audience area. With a 105 dB (A weighted) specification for the floor monitors, precisely controlled dispersion was very important, as was consistent performance at multiple heights, including standing, seated and floor level.

The Smaart test and measurement platform was deployed to capture data both on- and off-axis. FFT measurements were made for each unit, along with phase and magnitude response, sound pressure level, and sensitivity. "This was done in order to verify that the monitors responded 'in situ' in a manner similar to the published specifications of the manufacturers," O'Keefe explains.

Smaart in tandem with the software for the PLM software for the amplifiers also allowed the Chan Centre techs to quickly contour each monitor's sound to match the changing room tone on any given area on the stage. "The variable acoustics within the concert hall means that we can alter the room's early reflections and reverb decay to best suit the music and because of that degree of variation we needed a monitor system that was as equally variable," he says.

As per the established testing protocol, the AES standard A weighted shaped swept sine wave of 24 seconds duration as well as the AES standard Pink Noise were used as test stimuli, with the results measured and compared. "In most instances we had two examples of each model, which allowed us to verify results and quality control of the respective product lines," he adds.



A perspective of the Shun Concert Hall at the Chan Centre.

DRAMATICALLY DIFFERENT

In addition to measurements, listening tests were also performed using the test stimulus. To assist with this portion, Grammy Award winning multi-instrumentalist Randy Raine-Ruesch was invited to play a large array of complex instruments; in fact, he brought in a collection of about 30 of the hardest instruments to mic, including the Japanese Shō and Ichigenkin, nose flutes from Borneo. All of these are very different, and all are capable of incredibly complex harmonics and overtones.

"Because our room has dramatically variable acoustics (reverb decay times ranging from 2.6 to 4.9 seconds), and because the expectations for clarity of tone by the artists who grace our stage is so high, it was important to have products that not only provided a clear and concise frequency response, but were flexible, so we could adjust numerous parameters in very subtle ways," O'Keefe notes.

Raine-Ruesch's opinions and observations of the tonal quality, depth of field and

overall performance were another valuable asset in the selection process, with O'Keefe adding, "It was interesting that one product that had some of the best results as per the AES standards was among the least musical and had the poorest depth of field, and it was apparent within a few seconds of hearing a musician playing live."

After an initial round of testing, three preferred products were short-listed and re-evaluated in numerous scenarios. Each model was also utilized for a one-month period during numerous performances in the hall.

"This allowed for the greatest number of staff to use each product and assess its ease of operation and overall performance," O'Keefe says. "We also solicited the comments and criticisms of the artists who utilized the products during concert presentations."

From this exhaustive process, Adamson M15 wedges emerged as the choice, with 10 added to the Chan Centre inventory, where they were immediately pressed into duty. The M15 is outfitted with a 15-inch cone woofer joined by a 4-inch diaphragm compression driver on a 50-degree conical waveguide.

"The M15's conical waveguide was



Surfaces surrounding the stage acoustically amplify and disperse sound into the audience area.

specifically designed to minimize distortion while providing smooth response at varying performance heights, all the while keeping off-axis energy to a minimum," states Ewan MacDonald, Adamson applications engineer. "Many floor monitors perform well when an artist stands at a microphone, but not when the artist sits down. Our waveguide does not have this problem.

"We also believe our Kevlar cone architecture delivers superior linearity and frequency response which results in accurate reproduction at all listening levels, something that is very important for artists."

O'Keefe simply states, "The M15 outperformed monitors of a similar size and price point, not to mention greatly outperforming some of the most requested mod-



Adamson M15 stage monitor and Lab.gruppen PLM 10000Q amplifier.

els at a significantly higher price point."

The new monitors are driven by new PLM 10000Q amplifiers that were also added as part of the upgrade. Companion flight cases are used for easy transport of the wedges, while the amps are mounted in a portable rolling rack.

The amps allow the option of providing multiple variations of the same mix, "It's not uncommon for the horn section of a big band to share the same mix," O'Keefe concludes. "Invariably, however, it's too loud for the saxes and not bright enough for the trumpets, and the trombones want a little more low end. Since we have the PLM 10000Q, which has four amp channels, we can use a common EQ at the input stage and vary the EQ level and so on at the output stage, allowing us to contour the mixes to better suit the individual needs of the horn section." □